New York ISO
Independent System Operator

Capacity Accreditation

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ICAPWG/MIWG

October 27, 2022
Reposted: November 9, 2022

Agenda

- Previous Discussions
- Background
- Proposed Modeling Technique for Calculating CAFs
- ICAP Manual and Tariff Revisions
- Next Steps
- Appendix

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Previous Discussions

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Previous Discussions

Date	Working Group	Discussion Points and Links to Materials
August 5, 2021	ICAPWG	Review of Existing Capacity Accreditation Rules: https://www.nyiso.com/documents/20142/23590734/20210805%20NYISO%20-%20Capacity%20Accreditation%20Current%20Rules%20Final.pdf
August 9, 2021	ICAPWG	Capacity Accreditation Proposal: https://www.nyiso.com/documents/20142/23645207/20210809%20NYISO%20-%20Capacity%20Accreditation%20Straw%20Proposal.pdf
August 30, 2021 & August 31, 2021	ICAPWG	Capacity Accreditation Proposal: https://www.nyiso.com/documents/20142/24172725/20210830%20NYISO%20-%20Capacity%20Accreditation_v10%20(002).pdf
September 28, 2021	ICAPWG	Comprehensive Mitigation Review Proposal and Tariff: https://www.nyiso.com/documents/20142/24925244/20210928 NYISO - CMR Final.pdf/769828a1-f224-0140-240b-0762ec18efec
October 18, 2021	ICAPWG	Comprehensive Mitigation Review Proposal and Tariff Updates: https://www.nyiso.com/documents/20142/25440628/20211018%20NYISO%20-%20CMR%20v9.pdf/4475e775-159c-75c7-9cf8-7050dad9a363
October 29, 2021	ICAPWG	Comprehensive Mitigation Review Proposal and Tariff Updates: https://www.nyiso.com/documents/20142/25780701/20211029%20NYISO%20-%20CMR.pdf/ea8494b0-0860-b260-89b6-0c418d28a91d

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Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
November 2, 2021	ICAPWG	NYISO CMR Consumer Impact Analysis: https://www.nyiso.com/documents/20142/25835955/CIA%20-%20Comprehensive%20Mitigation%20Review.pdf/36d447d4-5b33-8ab1-2654-90a529ff1dfe Potomac CMR Consumer Impact Analysis: https://www.nyiso.com/documents/20142/25835955/MMU%20ICAP%20Accreditation%20Consumer%20Impact%20Analysis%2011-02-2021.pdf/637ba21e-db75-a4c1-5b41-f770dd26e529
November 9, 2021	BIC	Comprehensive Mitigation Review Proposal and Tariff: https://www.nyiso.com/documents/20142/25928340/5%2020211109%20NYISO%20-%20CMR%20v3.pdf/84d8b429-126c-68dd-0308-caa50886de92 Comprehensive Mitigation Review Approved Motion: https://www.nyiso.com/documents/20142/25928340/110921%20bic%20final%20motions.pdf/785d5869-1e04-9f97-e330-e2e632ae7a9c
November 17, 2021	MC	Comprehensive Mitigation Review Proposal and Tariff: https://www.nyiso.com/documents/20142/26119798/05%20CMR.pdf/11217ade-152a-74a2-d478-6b5ae5e21207 Comprehensive Mitigation Review Approved Motion: https://www.nyiso.com/documents/20142/26119798/111821%20MC_Final_Motions.pdf/bbf15d66-4108-7173-1596-9b20677914e6

Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
January 20, 2022	ICAPWG	2022 Market Projects: https://www.nyiso.com/documents/20142/27799605/2022%20Projects%20Presentation.pdf/4553eb95-177d-7cbc-f2fe-7754b7c66644
February 3, 2022	ICAPWG	Improving Capacity Accreditation Plan: https://www.nyiso.com/documents/20142/28227906/Improving%20Capacity%20Accreditation%20Plan.pdf/92560e95-5703-4c57-45cb-7706c36f4656
February 24, 2022	ICAPWG	Improving Capacity Accreditation Project Kick Off: https://www.nyiso.com/documents/20142/28687884/Capacity%20Accreditation%20Kick%20Off%2002-24-22%20v7.pdf/5ab742c4-650b-5094-6a22-d41a2f29da6f MARS Review (GE Consulting): https://www.nyiso.com/documents/20142/28687884/GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0224-v4.pdf/d302df1c-5607-16a8-ba01-fba700d5bbd1
March 3, 2022	ICAPWG	CMR Draft Deficiency Response: https://www.nyiso.com/documents/20142/28897222/CMR%20Deficiency%20Draft%20Responses%2003-03%20ICAPWG.pdf/0a3c8303-515e-7725-dee5-a9dda1398672

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Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
March 16, 2022	ICAPWG	Capacity Accreditation Resource Class Criteria, Resource-Specific Derating Factors, and Areas of Needed Change: https://www.nyiso.com/documents/20142/29177064/Capacity%20Accreditation%2003-16-22%20v7.pdf/b26e6a99-5f4e-29cc-c60c-47608c78c983
March 31, 2022	ICAPWG	Capacity Accreditation Representative Unit Modeling: https://www.nyiso.com/documents/20142/29607069/2%20CA%20Representative%20Unit%20Modeling%2003-31-22%20ICAPWG.pdf/1c3af8ac-625a-5066-3977-8c3d9ae0ddda ELCC and MRI Overview (GE): https://www.nyiso.com/documents/20142/29607069/3%20GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0331.pdf/08355c9a-d104-e1b6-6b8a-8266c61b74a3
April 19, 2022	ICAPWG	Capacity Accreditation Adjusted Resource Specific Derating Factors and External Resources: https://www.nyiso.com/documents/20142/30025560/04-19-22%20CA%20Adjusted%20Derating%20Factors%20and%20External%20Resources.pdf/5dd1f4b2-092d-6a6a-3b99-4d768ea6c5eb

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Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
April 28, 2022	ICAPWG	Preliminary Capacity Accreditation Resource Classes: https://www.nyiso.com/documents/20142/30276257/04-28-22%20Capacity%20Accreditation%20-%20Preliminary%20CARCs.pdf/c82c47c5-28c2-cf19-c602-16bf3cfc4aca Preliminary ELCC and MRI Results (GE): https://www.nyiso.com/documents/20142/30276257/GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0428.pdf/3c761f16-7bc0-b469-b1e8-c2a69feb58ef
May 24, 2022	ICAPWG	Updated Preliminary CARCs and Annual Process to Establish CARCs: https://www.nyiso.com/documents/20142/30888946/3%2005-24-22%20Capacity%20Accreditation.pdf/cd61d855-f634-0fe8-6109-7d8c0547beda Additional Preliminary ELCC and MRI Results (GE): https://www.nyiso.com/documents/20142/30888946/2%20GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0524.pdf/0976330d-f4eb-4db3-2613-c8be9bafe452
June 16, 2022	ICAPWG	Sensitivity Scenarios and Seasonal CAFs: https://www.nyiso.com/documents/20142/31532822/2%20Capacity%20Accreditation%20v6.pdf/4ffe4fa9-bdaf-2c23-77be-d49ed04c5ea5

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Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
June 28, 2022	ICAPWG	Annual Peak Load Window (PLW) Review and Energy Duration Limitation Proposals: https://www.nyiso.com/documents/20142/31790818/06-28-22%20PLW%20and%20EDL%20Proposal.pdf/ffca7c8a-767e-3de1-9b46-404f661351b3 Revised Shape-based Resource Results and ELR Modeling Functionality in MARS (GE): https://www.nyiso.com/documents/20142/31790818/GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0628.pdf/999c7dfa-0b5d-a6bc-a57a-b35a1cda5aa4
July 21, 2022	ICAPWG	Capacity Accreditation: Project Schedule Update: https://www.nyiso.com/documents/20142/32356084/7-21-2022%20ICAPWG%20Project%20Schedule.pdf/958ef86a-12de-32a1-c115-5c1af39abb54
July 28, 2022	ICAPWG	Capacity Accreditation: SCR CAF Results and Proposal: https://www.nyiso.com/documents/20142/32491922/2%207282022%20ICAPWG%20Capacity%20Accreditation.pdf/3f991228-5011-7cc2-cfd3-a7762fa8c8f6 Sensitivity Scenario Methodologies (GE): https://www.nyiso.com/documents/20142/32491922/3%20GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0728.pdf/9fd89cbc-2baa-3c54-dc74-17c2e8cf588a

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Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
August 9, 2022	ICAPWG	Modeling Discussion and ICAP Manual Revision Process Options: https://www.nyiso.com/documents/20142/32687686/08-09-22%20Capacity%20Accreditation.pdf/1009a4dc-bb9f-17f3-bb34-908fd8d5704d
August 29, 2022	ICAPWG	Annual CAF Proposal, Winter PLW Assessment, and CAF Interaction with the ICAP Demand Curves: https://www.nyiso.com/documents/20142/32977661/Capacity%20Accreditation%2008292022%20ICAPWG.pdf/13c04d12-f77f-3184-15c4-8f0b22897f3d Compiled Preliminary CAF Results: https://www.nyiso.com/documents/20142/32977661/GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_LCR-results.pdf/e9fdeb01-1ee0-7651-6a3f-0823aedcef1d
September 30, 2022	ICAPWG	Resource Specific Derating Factor Proposal for Performance-based Resources, CAF Interaction with ICAP Demand Curves, ISO Review of Peak Load Windows, and Modeling CAFs At Criteria vs Level of Excess: https://www.nyiso.com/documents/20142/33520089/9-30-2022%20ICAPWG%20Capacity%20Accreditation%20v3.pdf/0178b3b4-4398-ce4a-3197-224e24086c51 Capacity Value Results for 2022 LCR at LOE and 2022 RNA 2030 Base Case (GE): https://www.nyiso.com/documents/20142/33520089/GEEC-CapacityAccreditation-LOEandBaseRNA-results%20v5%20-%20clean.pdf/4e05032a-91c3-ff78-08a2-9202efead08a Consumer Impact Analysis Methodology: https://www.nyiso.com/documents/20142/33520089/CIA%20Methodology%20-%20Capacity%20Accreditation_Final.pdf/37c9b5f5-ab29-8eb0-afd2-fdc369f097f5

Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
October 19, 2022	ICAPWG	Translation Factors for IRM/LCR Studies and Deliverability Testing, Sensitivity Scenario Update, and ICAP Market Resource Adequacy 5 Year Plan: https://www.nyiso.com/documents/20142/33857891/02a_10-19-22%20ICAPWG%20Capacity%20Accreditation.pdf/cae2063d-76d6-b4d3-25d5-fadd0c5e1f50 Compiled CAF Results (Excel file): https://www.nyiso.com/documents/20142/33857891/02b_10-19-22%20ICAPWG%20Compiled%20CAF%20Results.xlsx/cf5ad8f9-b4fb-9f44-9df2-672f9a190331 Capacity Accreditation - Consumer Impact Analysis: https://www.nyiso.com/documents/20142/33857891/03_Consumer%20Impact%20-%20Capacity%20Accreditation.pdf/1e9097c6-c0ae-b137-dd44-15ce1f5a7841

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Background

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Background

- **The NYISO has begun stakeholder discussions to (1) develop the implementation details and technical specifications for establishing Capacity Accreditation Factors (CAFs) and Capacity Accreditation Resource Classes (CARCs) and (2) propose necessary ICAP Manual revisions**
  - The NYISO has contracted with GE Energy Consulting to support the NYISO and its stakeholders in the development of the implementation details and technical specifications
- **The 2022 Improving Capacity Accreditation project deliverable is a Q3 Market Design Complete**
  - Completion of the project is delayed. The NYISO is now targeting a Q4 Market Design Complete

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Proposed Modeling Technique for Calculating CAFs

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Proposed Modeling Technique for Calculating CAFs

- Through its work with GE Energy Consulting , the NYISO has evaluated a variety of representative unit modeling characteristics and modeling techniques for calculating CAFs. The NYISO and GE have tested the robustness of these modeling characteristics and techniques under both current and future system conditions
- Based on this testing, the NYISO is proposing the following combination of representative unit modeling characteristics and techniques for calculating CAFs:
  - Use of the Marginal Reliability Improvement (MRI) technique
    - The MRI technique has consistently produced similar CAFs to the ELCC technique and requires a fraction of the computational time
  - 100 MW step size for the representative unit
    - The 100 MW step size is sufficiently large to produce stable CAFs and sufficiently small to reflect a marginal reliability contribution
  - The following representative unit modeling zone for each capacity region:
    - Zone F for the Rest of State
    - Zone G for the GHI
    - Zone J for the NYC
    - Zone K for the LI
- The following slides support the modeling recommendations as a robust and efficient technique for calculating CAFs
  - The following statistics and figures were calculated using CAF results from the following available cases: 2022 LCR, 2022 LOE, RNA 2030 Base Case (preliminary results), RNA 2030 Policy Case (preliminary results), and 2023 IRM PBC

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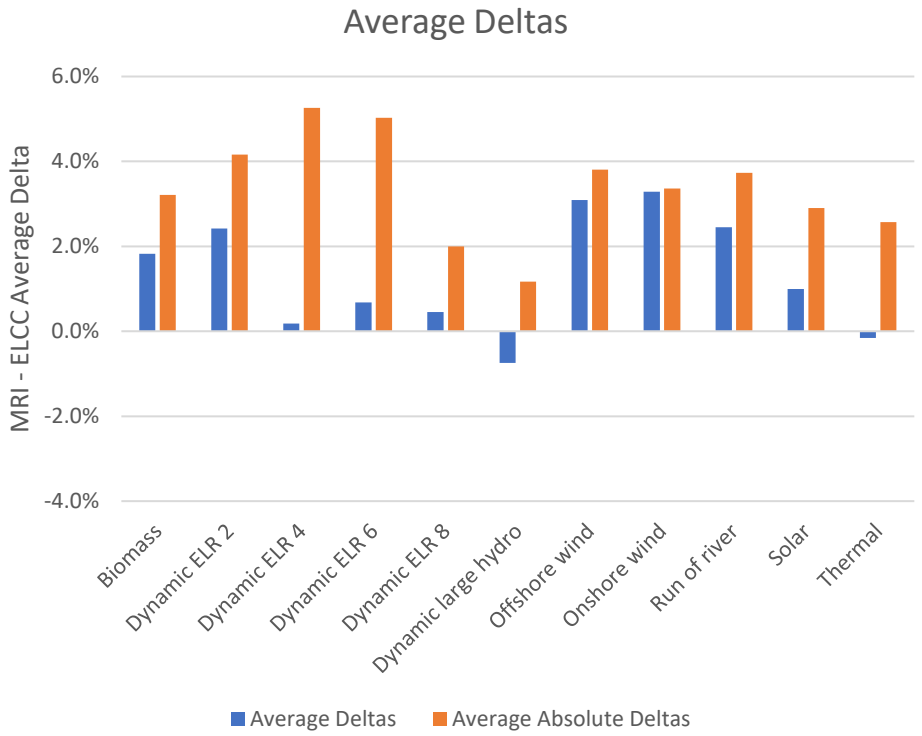
MRI vs ELCC

- **The MRI technique has consistently produced similar CAFs to the ELCC technique and requires a fraction of the computational time**
  - On average, the MRI technique produces a CAF within 3.4 percentage points of the CAF produced from the ELCC technique
  - An MRI run requires 2.5-3 hours compared to an ELCC run which can require 15-30 hours



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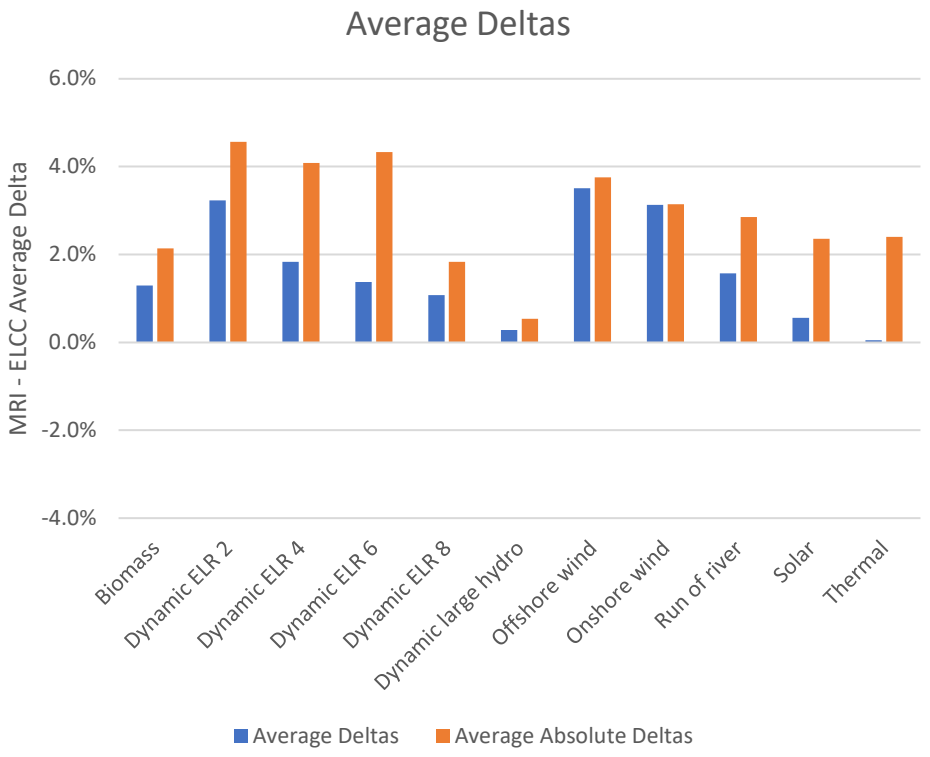
MRI vs ELCC

- When limited to the 100 MW step size and proposed modeling zones for each capacity region, the MRI technique produces a CAF within 3 percentage points on average of the CAF produced from the ELCC technique
  - Results for large hydro and onshore wind shown on the right are for the 100 MW step size across all modeled zones
    - No existing large hydro or onshore wind are present in the proposed modeling zones, and therefore CAFs were not tested in those zones



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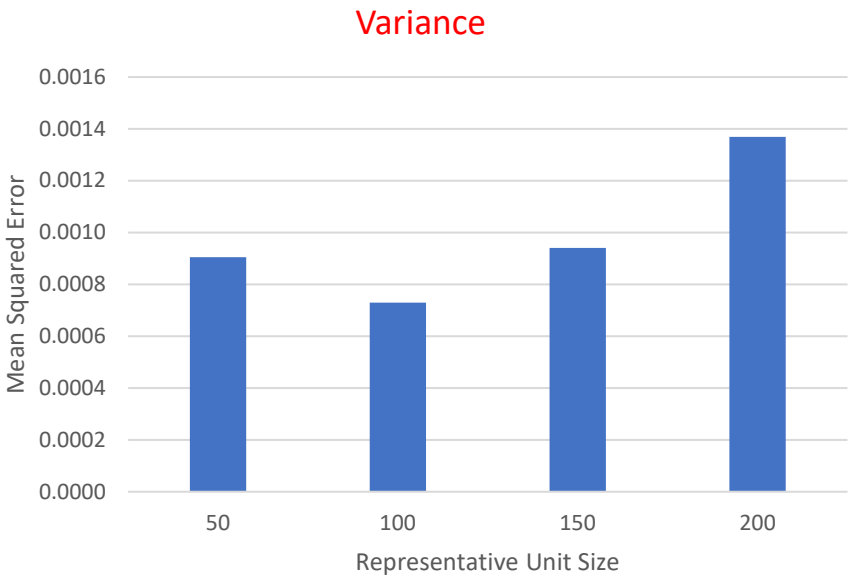
Representative Unit Size

- **The 100 MW step size for the representative unit is sufficiently large to produce stable CAFs and sufficiently small to reflect a marginal reliability contribution**
  - The 100 MW step size produces the smallest variance across all modeling permutations
    - Variance was calculated as the average of the squared differences between each CAF to the average CAF for the capacity region by resource type, modeling technique and case



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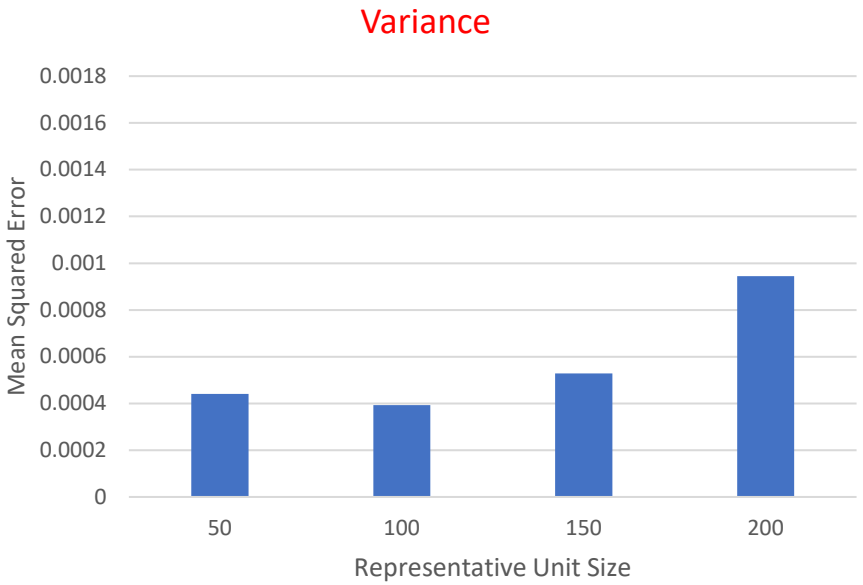
Representative Unit Size

- When limited to the MRI technique and proposed modeling zones for each capacity region, the 100 MW step size continues to produce the smallest variance



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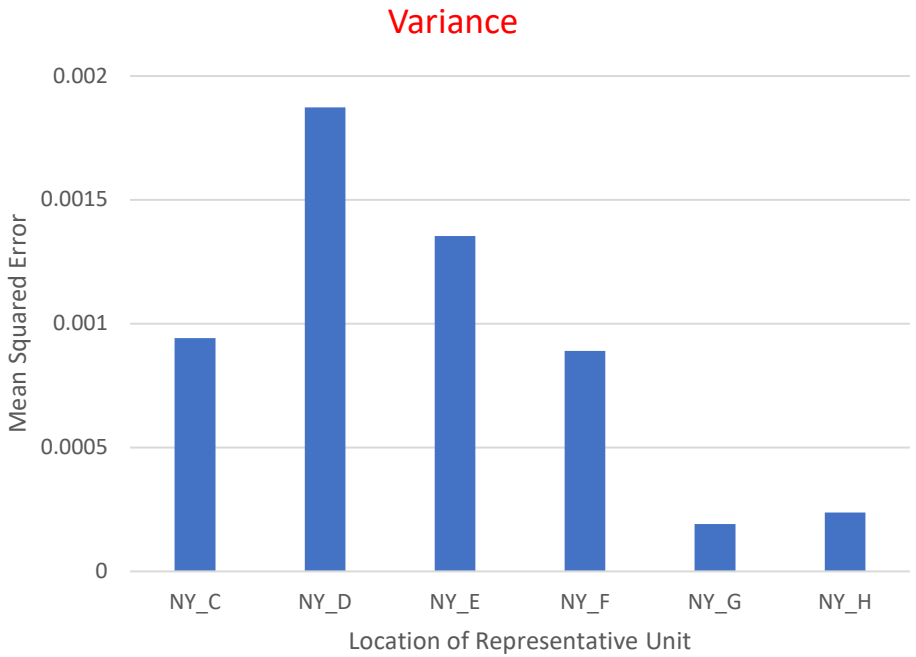
Representative Unit Modeling Zones

- **The proposed representative unit modeling zones also result in the smallest variance**
  - Variance was calculated as the average of the squared differences between each CAF to the average CAF for the capacity region by resource type, modeling technique and case



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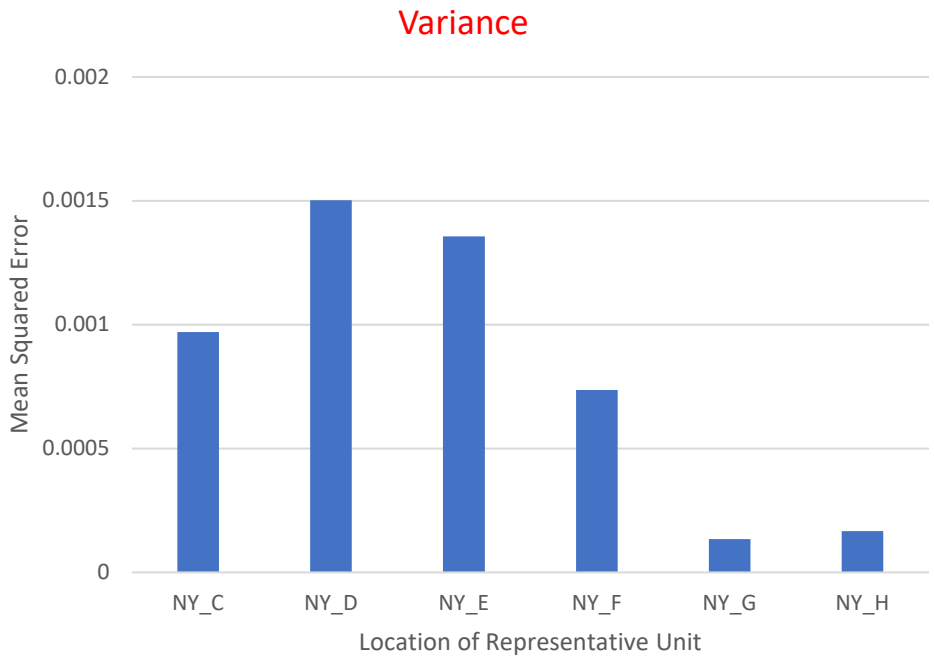
Representative Unit Modeling Zones

- When limited to the MRI technique and 100 MW step size, the proposed modeling zones continues to produce the smallest variance



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ICAP Manual and Tariff Revisions

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ICAP Manual and Tariff Revisions

- **The NYISO has completed a subset of ICAP Manual and tariff revisions for the Capacity Accreditation project**
- **The following slides summarize the ICAP Manual revisions posted with today's meeting materials**
  - A proposed tariff revision to MST 5.12.7 is presented on slides 28-29. Due to the Hybrid Aggregated Storage (HSR) Model project also proposing revisions to MST 5.12.7, the NYISO is determining how best to proceed with each set of revisions
- **The NYISO will return with additional ICAP Manual revisions in November**
  - These revisions will cover how CARCs are established, how resources are assigned to CARCs, how CAFs are calculated, updated resource specific derating factors and UCAP calculations

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ICAP Manual and Tariff Revisions

- **ICAP Manual revisions posted with today's meeting materials:**
  - Section 2.5-2.6
  - Section 4.1.1
  - Section 4.12.2.1
  - Section 4.2.1
  - Section 4.2.2.2
  - Section 4.8.2
  - Section 5.5
  - Attachment M
  - Section XX

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ICAP Manual and Tariff Revisions

- **ICAP Manual - Section 2.5-2.6**
  - Revised for clarity and to reflect the replacement of “Adjusted Installed Capacity” with “Installed Capacity” in the translation of ICAP requirements to UCAP, beginning with the 2024 Capability Year
    - This revision reflects the update to MST 5.10 and MST 5.11 accepted by FERC on August 10th, 2022
  - Sunsets the current calculation of Adjusted Installed Capacity with the 2024 Capability Year
    - The current calculation also sunsets with the 2024 Capability Year in MST 5.12.14.2
    - The updated calculation will be included in Section 4.5 of the ICAP Manual as part of the next set of ICAP Manual revisions for the Capacity Accreditation project

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ICAP Manual and Tariff Revisions

- **ICAP Manual - Section 4.1.1**
  - Revised to reflect the sunsetting of the Duration Adjustment Factors for ICAP Suppliers with Energy Duration Limitations and existing Peak Load Windows with the 2024 Capability Year
    - Capacity Accreditation Factors will replace Duration Adjustment Factors for all resources beginning with the 2024 Capability Year
    - The annual review process for establishing the Peak Load Windows beginning with the 2024 Capability Year will be included in a new section of the ICAP Manual
      - New section included as Section XX in today's materials and discussed on slide 31
- **ICAP Manual - Section 4.12.2.1**
  - Revised to replace the Duration Adjustment Factor with the applicable Capacity Accreditation Factor for SCRs beginning with the 2024 Capability Year

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ICAP Manual and Tariff Revisions

- **ICAP Manual - Section 4.2.1 and Section 4.2.2.2**
  - Revised to reflect the DMNC test period requirements for ICAP Suppliers with Energy Duration Limitations longer than the Peak Load Window
- **ICAP Manual - Section 4.8.2**
  - Revised to reflect the bidding, scheduling, and notification requirements for ICAP Suppliers with Energy Duration Limitations longer than the Peak Load Window
- **ICAP Manual - Attachment M**
  - Revised to reflect the registration requirements and bidding and scheduling, details for ICAP Suppliers with Energy Duration Limitations longer than the Peak Load Window
- **MST 5.12.7**
  - Revised to reflect the bidding, scheduling, and notification requirements for ICAP Suppliers with Energy Duration Limitations longer than the Peak Load Window
  - Revisions shown on slides 28-29

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ICAP Manual and Tariff Revisions

- **MST 5.12.7 Revision for Installed Capacity Suppliers with Energy Duration Limitations that are not Energy Storage Resources**
  - Until the Capability Year that begins in May 2024, Installed Capacity Suppliers with Energy Duration Limitations corresponding to a Duration Adjustment Factor, as described in Section 5.12.14 below, must on a daily basis during the Peak Load Window and for the number of consecutive hours that correspond to its Energy Duration Limitation, or for the entirety of the Peak Load Window for an Energy Storage Resource : (i) schedule a Bilateral Transaction; (ii) Bid Energy in the Day-Ahead Market in accordance with the applicable provisions of Section 5.12.1 of this Tariff; or (iii) notify the ISO of any outages.
  - Starting with the Capability Year that begins in May 2024, Installed Capacity Suppliers with Energy Duration Limitations less than or equal in length to the number of hours inside the Peak Load Window, must on a daily basis during the Peak Load Window and for at least the number of consecutive hours that correspond to its Energy Duration Limitation, or for the entirety of the Peak Load Window for an Energy Storage Resource: (i) schedule a Bilateral Transaction; (ii) Bid Energy in the Day-Ahead Market in accordance with the applicable provisions of Section 5.12.1 of this Tariff; or (iii) notify the ISO of any outages. Installed Capacity Suppliers with Energy Duration Limitations greater in length than the number of hours inside the Peak Load Window, must on a daily basis during the entirety of the Peak Load Window and for each hour immediately preceding and following the Peak Load Window, for the remaining hours of the Installed Capacity Supplier's Energy Duration Limitation that are not captured in the Peak Load Window: (i) schedule a Bilateral Transaction; (ii) Bid Energy in the Day-Ahead Market in accordance with the applicable provisions of Section 5.12.1 of this Tariff; or (iii) notify the ISO of any outages.

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ICAP Manual and Tariff Revisions

- **MST 5.12.7 Revision for Installed Capacity Suppliers with Energy Duration Limitations that are Energy Storage Resources**
  - Until the Capability Year that begins in May 2024, Energy Storage Resources with an Energy Duration Limitation must, on a daily basis, and for each hour outside of the Peak Load Window: (i) Bid in the Day-Ahead Market in accordance with the applicable provisions of Section 5.12.1 of this Tariff; or (ii) notify the ISO of any outages, the maximum of the Energy Storage Resource's (a) negative Installed Capacity Equivalent, or (b) Lower Operating Limit. The amount scheduled, Bid, and/or declared to be unavailable must reflect the Energy Storage Resource's entire withdrawal operating range.
  - Starting with the Capability Year that begins in May 2024, Energy Storage Resources with an Energy Duration Limitation less than or equal in length to the number of hours inside the Peak Load Window must, on a daily basis, and for each hour outside of the Peak Load Window: (i) Bid in the Day-Ahead Market in accordance with the applicable provisions of Section 5.12.1 of this Tariff; or (ii) notify the ISO of any outages, the maximum of the Energy Storage Resource's (a) negative Installed Capacity Equivalent, or (b) Lower Operating Limit. Energy Storage Resources with an Energy Duration Limitation greater in length than the number of hours inside the Peak Load Window must, on a daily basis, and for each hour outside of the hours that the Energy Storage Resources must schedule, bid, or declare to be unavailable in accordance with paragraph three of Section 5.12.7 of this Tariff: (i) Bid in the Day-Ahead Market in accordance with the applicable provisions of Section 5.12.1 of this Tariff; or (ii) notify the ISO of any outages, the maximum of the Energy Storage Resource's (a) negative Installed Capacity Equivalent, or (b) Lower Operating Limit.

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ICAP Manual and Tariff Revisions

- **ICAP Manual - Section 5.5**
  - Revised to:
    - Remove the Duration Adjustment Factor of the peaking unit from the calculation of the monthly reference point prices for the ICAP Demand Curves
    - Clarify the translation of the quantities on the ICAP Demand Curve to UCAP terms
    - Update the translation of the ICAP Demand Curve prices to UCAP terms to include the Capacity Accreditation Factor and applicable derating factor of the peaking unit for the respective ICAP Demand Curve beginning with the 2024 Capability Year

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ICAP Manual and Tariff Revisions

- **ICAP Manual - Section XX**
  - This is a new section describing the annual review process to establish the Peak Load Windows beginning with the 2024 Capability Year
  - This section will be given a section number after all ICAP Manual revisions for the Capacity Accreditation project are included

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Next Steps

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Next Steps

- The NYISO plans to return to the ICAPWG in November with additional ICAP Manual revisions for the Capacity Accreditation project

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Questions?

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Appendix

CAFs vs Resource Specific Derating Factors

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Capacity Accreditation Factors

- **CAFs will reflect the marginal reliability contribution of the representative unit of each CARC for each location that is evaluated**
- **The impact of the following characteristics would be captured by CAFs:**
  - Energy Duration Limitations
  - Correlated unavailability due to weather and/or fuel supply limitations
  - Synergistic and antagonistic effects
  - Start-up notification time limitations

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Resource Specific Derating Factors

- **As discussed previously, resource specific derating factors will capture differences in availability that is specific to an individual resource and not captured in the CAF of the resource's CARC**
  - Examples:
    - Forced outages, forced derates, failed starts, etc.
    - Resource output that is different from the modeled production profile of the CARC
- **Generally, a Resource's UCAP will be determined by combining the Resource's ICAP, CAF, and resource specific derating factor as illustrated below**
  - UCAP = Adjusted ICAP x (1 – resource specific derating factor)
    - Where:
      - Adjusted ICAP = ICAP * CAF
      - ICAP = min(DMNC, CRIS)
    - So, UCAP = min(DMNC, CRIS) * CAF * (1 – resource specific derating factor)
  - For more information on current resource-specific derating factors, see the 03/16/22 ICAPWG presentation

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Draft 5 Year ICAP Market Resource Adequacy Plan

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Draft 5 Year ICAP Market Resource Adequacy Plan

- **The NYISO has been coordinating with the NYSRC Executive Committee on the needs for updating the Resource Adequacy model and methods for use with the ICAP Market**
  - These needs encompass the changing electricity system and the need to refine the calculations of both Resource Adequacy Reliability Targets and the Capacity Accreditation value of resources
  - The following slides are a draft of a 5-year plan to enhance the Resource Adequacy model and methods for use with the ICAP Market

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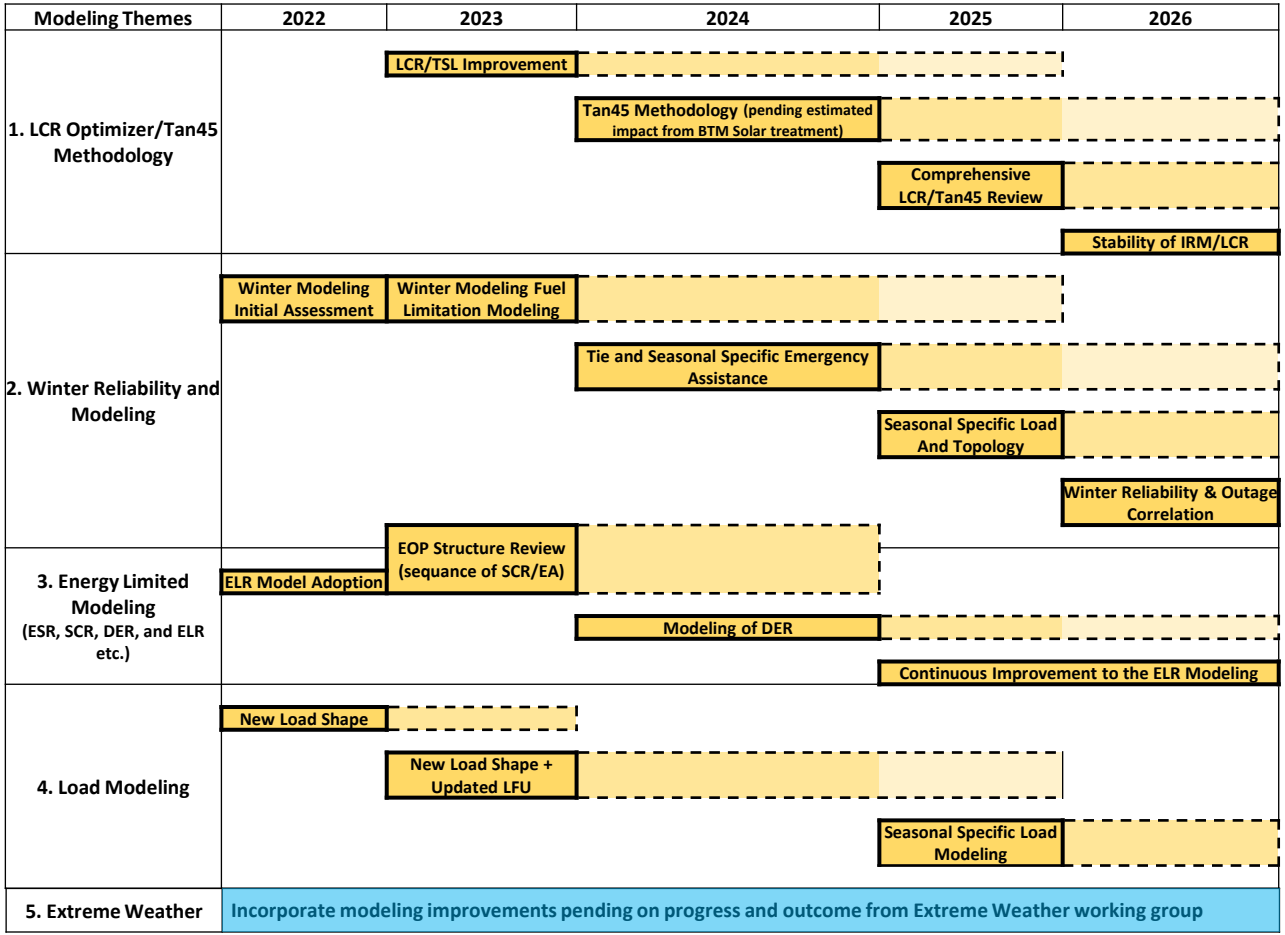
The Proposed RA Model Improvements & Strategic Priorities



LEGEND:

- NYISO Proposed Prioritized Modeling Improvements
- Expected Implementation Phase for IRM and Capacity Accreditation Process
- Extended Implementation Phase for IRM and Capacity Accreditation Process
- Specific model improvements are to be determined

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NYSRC Modeling Priorities for 2023

- **Theme 1: Improvement to the LCR optimizer tool**
  - Consider inputs from MMU to ensure intuitive LCR outcome and stability of model results
- **Theme 2: Winter Reliability Modeling**
  - Fuel limited modeling with the focus on gas constraints during winter season
- **Theme 3: Investigate and improve the sequence within EOP steps, particularly Emergency Assistance and SCRs**
  - Improvement in this area will have an impact on the ELR modeling and set up for winter reliability modeling improvement for 2024
- **Theme 4: Adopt the new load shapes and improve LFU scaling in the IRM study**
  - LFU modeling improvement (LFU Phase 3 Whitepaper)
  - New load shapes combining with improved scaling from the LFU phase whitepaper
- **Additional items may be desired:**
  - (by RA team) Testing of the impact of BTM solar to inform prioritization for 2024 Tan45/LCR/TSL improvement
  - (by NYSRC) Theme 5 - Extreme weather event modeling, improve ESR modeling and offshore wind impact

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NYSRC Modeling Priorities for 2024

- **Theme 1: Comprehensive review of the IRM setting process, particularly the Tan45 methodology**
  - The current Tan45 methodology will require improvement in shifting capacity between upstate and downstate
  - The improved LCR optimizer may offer an alternative methodology to the Tan45 process
  - Pending on estimated impact, incorporate the BTM solar methodology in the comprehensive Tan45/LCR review
- **Theme 2: Winter Reliability Modeling**
  - Improve the modeling for emergency assistance from individual intertie and seasonal assumptions (summer and winter)
  - Effort to improve and simplify the external area modeling may also be included
- **Theme 3: Modeling for emerging resources/participation modes, i.e. DER, CSR and Hybrid resources**
  - Improvement to the ELR model may be required
- **Additional Items that may be desired:**
  - (by RA team) Investigate impacts on LCRs post peaker retirement
  - (by NYSRC) Theme 5 - Extreme weather event modeling, improve ESR modeling
  - (by NYISO) Support the Capacity Demand Curve reset process

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NYSRC Potential Focus for 2025-2026

- **Theme 1: Continue the enhancement of Tan45 and LCR processes**
  - Shifting methodology in Tan45 process may start to fail after significant resource and topology changes between upstate and downstate
  - Impact from changes to southeast reliability due to combination of peaker retirement and offshore wind entry
  - Methodology review between the Tan45 and the LCR optimizer, with the potential of optimizing the IRM
  - Ensure the stability of IRM and LCR outcomes amid significant system changes and modeling enhancements
- **Theme 2: Continue to refine assumptions during winter season and assess the reliability during winter**
  - Winter assumptions include incorporating winter peak in load modeling (Theme 4) , seasonal topology limits, as well as weather correlated outages
- **Theme 3: Continue the modeling improvement for energy limited resources, particularly the modeling for DER, SCR and large penetration of ESRs**
- **Additional Items that may be desired by the NYSRC includes**
  - Theme 5 - Extreme weather event modeling and additional reliability standards

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Capacity Accreditation (5-Year Plan)

- **The Capacity Accreditation project is expected to involve continuous model improvement and implementation for the next 5 years. The anticipated work scope includes:**
  - 2023
    - Implementation of Capacity Accreditation process and software
    - Research on Gas Constraints, Start up time, and SCR modeling
  - 2024
    - Implementation of Gas Constraints, Start up time, and SCR modeling
    - Research on Winter Reliability issues
  - 2025
    - Implementation of Winter Reliability Issues
    - Research on Correlated outages and unit size
  - 2026
    - Implementation of Correlated outages and unit size
    - Research on alignment of load and resource output profiles

New York ISO

Our Mission & Vision

Mission

Ensure power system reliability and competitive markets for New York in a clean energy future

Vision

Working together with stakeholders to build the cleanest, most reliable electric system in the nation

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